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## PATENT ABSTRACTS OF JAPAN

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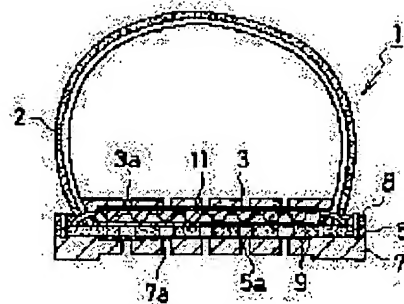
(72)Inventor : WATANABE TADAHIKO

(54) SHOE SOLE

(57)Abstract:

PURPOSE: To provide a shoe sole having an air permeable and water impermeable film excellent in durability and improved air permeation characteristic and ventilation function irrespective of the structure of the front surface of sole and being capable of preventing infiltration of water into the shoe in case of breakage of the air permeable film.

CONSTITUTION: This shoe sole comprises an outer sole part 7 having through holes 7a; a film carrier 5 having through holes 5a; an inner sole part 3 having through holes 3a; a lamination sheet 9 where a water impermeable and air permeable film is held between coarse woven cloth and fine woven cloth; and an inner material 11 for facilitating discharge of moist in a shoe body.



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## LEGAL STATUS

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PRIOR ART

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[Description of the Prior Art] Conventionally, \*\*\*\*\* using the permeability film having waterproofness and permeability of non-water permeability is various. Especially, it is used abundantly at sportswear and outdoor goods. However, in shoes, the use to a sole has not yet spread in extent seen by the amount of [, such as trekking shoes using cloth ] back. Simply, while preparing a through tube in outsole, although the structure of sticking the permeability film on an outsole inside is also considered, it is thought that its danger that foreign matters, such as sand, will damage the permeability film itself through the through tube of outsole from the exterior is very high since a sole is what touches direct surface of the earth. Since a wearer's guide peg has furthermore always stuck to the inner SOL, migration of the air in shoes is considered that it cannot fully demonstrate the function of said permeability film rather than being able to be easy unexpectedly. The following structures are indicated by JP,63-99503,U as shoes which solve such a technical problem. That is, in a sole with the outsole which has a through tube, and the non-water permeability permeability film, the foreign matter penetration from the outside is prevented by attaching an inclination to the through tube of the outsole, and the configuration which promotes the air migration in shoes using distortion of the inclined through tube produced for every walk in coincidence is taken.

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TECHNICAL FIELD

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[Industrial Application] This invention relates to the sole which loaded with the object while promoting permeability.

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TECHNICAL PROBLEM

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[Problem(s) to be Solved by the Invention] However, even if it can protect foreign matter penetration from an outsole part temporarily only by making the through tube of outsole incline, since the permeability film is always direct made into the external world, a problem is still in the durability. moreover, long-term use -- or when the permeability film is damaged by penetration of a foreign matter, there is a possibility that water may advance easily. Furthermore, wear of the outsole which may naturally happen has a possibility of decreasing distortion of a through tube, as a result making air migration imperfect. Then, this invention aims at offering the sole which can prevent penetration of the water into shoes, even when this permeability film is both [ suddenly ] temporarily torn almost regardless of wear of outsole also in the permeability film of non-water permeability which was excellent in durability with slight height in the permeability in shoes, and a ventilation function out of shoes at coincidence.

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EFFECT OF THE INVENTION

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[Effect of the Invention] Since it is loaded according to the sole concerning this invention, without an object fixing between an inner SOL and the simple substance for film while having heights, since it is the magnitude in which the repeat of the pressurization and reduced pressure at the time of the touch-down at the time of a walk can promote the air migration in shoes, and the plane area of the inside object can cover all the through tubes of an inner SOL, even if the permeability film is damaged, water cannot permeate easily in shoes. Moreover, since the structure which also laminates the permeability film with textile fabrics with a coarse eye and textile fabrics with a fine eye is adopted, durability is higher than before.

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the sole which loaded with the object while promoting permeability.

[0002]

[Description of the Prior Art] Conventionally, \*\*\*\*\* using the permeability film having waterproofness and permeability of non-water permeability is various. Especially, it is used abundantly at sportswear and outdoor goods. However, in shoes, the use to a sole has not yet spread in extent seen by the amount of [, such as trekking shoes using cloth ] back. Simply, while preparing a through tube in outsole, although the structure of sticking the permeability film on an outsole inside is also considered, it is thought that its danger that foreign matters, such as sand, will damage the permeability film itself through the through tube of outsole from the exterior is very high since a sole is what touches direct surface of the earth. Since a wearer's guide peg has furthermore always stuck to the inner SOL, migration of the air in shoes is considered that it cannot fully demonstrate the function of said permeability film rather than being able to be easy unexpectedly. The following structures are indicated by JP,63-99503,U as shoes which solve such a technical problem. That is, in a sole with the outsole which has a through tube, and the non-water permeability permeability film, the foreign matter penetration from the outside is prevented by attaching an inclination to the through tube of the outsole, and the configuration which promotes the air migration in shoes using distortion of the inclined through tube produced for every walk in coincidence is taken.

[0003]

[Problem(s) to be Solved by the Invention] However, even if it can protect foreign matter penetration from an outsole part temporarily only by making the through tube of outsole incline, since the permeability film is always direct made into the external world, a problem is still in the durability. moreover, long-term use -- or when the permeability film is damaged by penetration of a foreign matter, there is a possibility that water may advance easily. Furthermore, wear of the outsole which may naturally happen has a possibility of decreasing distortion of a through tube, as a result making air migration imperfect. Then, this invention aims at offering the sole which can prevent penetration of the water into shoes, even when this permeability film is both [ suddenly ] temporarily torn almost regardless of wear of outsole also in the permeability film of non-water permeability which was excellent in durability with slight height in the permeability in shoes, and a ventilation function out of shoes at coincidence.

[0004]

[Means for Solving the Problem] The outsole which has the through tube which penetrates this invention from an inside side to a ground-plane side in order to attain the above-mentioned purpose, The support for film by which a laminating is carried out to an outsole inside so that it may have the through tube penetrated from an inside side to a ground-plane side and this through tube may be open for free passage with the through tube of outsole, In the sole which comes to have the permeability film of non-water

permeability of this support for film by which a laminating is carried out at least to the whole surface, and the inner SOL which has the through tube penetrated from an inside side to a ground-plane side. While having the plane area which can cover all the through tubes of an inner SOL, it is characterized by arranging the object between the support for film, and an inner SOL, without fixing, while having two or more heights which project in a ground-plane side.

[0005]

[Example]

[0006] Hereafter, the example of this invention is explained in full detail based on drawing 1 - drawing 3. The sole 1 concerning this invention consists of upper leather 2, inner SOL 3, a mid sole 5, outsole 7, a lamination sheet 9, an inside object 11, and a shank 13, as shown in drawing 1. that in which inner SOL 3 sewn by upper leather 2 forms the whole insole -- it is -- the -- it did not step on but much through tube 3a has penetrated from the top face to the ground-plane side between the section and the tiptoe section (henceforth a "pedal"). If the aperture of this through tube 3a can change the object for business, the object for sports, etc. suitably according to the application of shoes, for example, that aperture is enlarged comparatively in the case of for sports etc. or it makes distribution density of a through tube high, ventilation will be promoted more.

[0007] A mid sole 5 is equivalent to the support for film in this invention. This mid sole 5 is sponge-like, and in this example, since the following outsole 7 is sutured while it is sewn by the thin leather 8 and fixed to upper leather 2, it has the bigger periphery section by that sewing cost than the periphery of said inner SOL 3. Much through tube 5a is prepared also in the mid sole 5 at the pedal as well as inner SOL 3. Although not limited, especially the aperture of this through tube 5a is desirable since the alignment of these through tubes 3a, 5a, and 7a becomes easy, when it forms more greatly than the aperture of through tube 3a of said inner SOL 3, or through tube 7a of outsole 7.

[0008] In this mid sole 5, the lamination sheet 9 has fixed so that all of that through tube 5a may be covered from both sides. This lamination sheet 9 has a three-tiered structure of textile-fabrics 9a with a coarse eye (for example, trade name made from Asahi Chemical APIKO "tricot"), permeability film 9b (for example, trade name by NITTO DENKO CORP. "micro tex") of non-water permeability and polyester textile-fabrics 9c with a fine eye, or a nonwoven fabric. The fixing approach sizes on the periphery section of textile-fabrics 9a with a coarse eye first, assigns it to the predetermined part of a mid sole 5, and piles up permeability film 9b there. Next, polyester textile-fabrics 9c sized on the periphery section is piled up. A paste permeates and fixes textile-fabrics 9a with a coarse eye, and permeability film 9b from the coarse eye of this textile-fabrics 9a. In addition, although the lamination sheet 9 is fixed to both sides of a mid sole 5, only one side is either here.

[0009] Through tube 3a of above-mentioned inner SOL 3 and through tube 5a of a mid sole 5, and through tube 7a that is open for free passage through the lamination sheet 9 are prepared in the pedal at outsole 7. In addition, since the heights of the tread pattern (not shown) formed in the ground-plane side of outsole 7 will support the load at the time of a walk directly, if through tube 7a is prepared in the crevice, possibility of getting foreign matters, such as a pebble, blocked can be lessened.

[0010] The inside object 11 is the tabular flexible urethane in which heights 11a of a large number which project in a ground-plane side was formed, and shallow dimple-like crevice 11b is formed in the opposite side, i.e., inside, side. The inside [ this ] object 11 has the plane area which can cover all through tube 3a prepared in inner SOL 3, and it is loaded with it, without fixing between said mid soles 5 (lamination sheet 9 by the side of the inside which fixed to the mid sole 5 in this example) and inner SOLs 3.

[0011] According to the sole of this example, whenever outsole 7 grounded at the time of a walk, while having two or more heights 11a, a wearer's weight is pressurized by the object 11 through inner SOL 3. Although the inside object 11 has the plane area which can cover all through tube 3a of inner SOL 3. Since it is arranged without fixing between a mid sole 5 and inner SOL 3, It moves into the space inserted into the ground-plane side at surroundings lump each heights 11a from few clearances which distortion produces in the inside object 11 by this load, and the moisture in upper leather 2 produces in the periphery of the inside object 11 through through tube 3a of inner SOL 3. And the moisture in shoes



is discharged by this distortion being repeated through through tube 5 of mid sole 5 which are pore [ of permeability film 9b of the lamination 9 prepared in the ground-plane side ], and support for film a, and through tube 7a of outsole 7. The inside object 11 incorporates new air to the space of each heights 11a, usually restoring to the gestalt at the time by being released from a load. While this fresh air is incorporated by the repeat of pressurization and reduced pressure to the inside object 11 at the time of a walk, i.e., the repeat [ object / 11 / inside ] of distortion, from the periphery of the inside object 11, as described above, the moisture in shoes is discharged. On the other hand, since permeability film 9b of non-water permeability is arranged, the water which advances through through tube 7a of outsole 7 from a ground-plane side at the time of a walk does not invade up to the inside of shoes. Since the plane area of the inside object 11 is the magnitude which can cover all through tube 3a prepared in inner SOL 3 even if the lamination sheet 9 is torn and the function of permeability film 9b is spoiled by long-term use, it is obstructed by the object 11 in this and water does not sink in to the inside of inner SOL 3 in shoes.

[0012] In addition, in above-mentioned this example, although the improvement in permeability in shoes and the arrangement part of the through tube as a ventilating opening are used as the pedal, it is also possible to prepare all over the heel of shoes, the arch-of-foot section, and the heel section in consideration of the application and the operating environment assumed of shoes. Moreover, like the above-mentioned example, through tube 7a of outsole 7 considers only as a pedal, and does not step on the through tubes 3a and 5a of inner SOL 3 and a mid sole 5, but you may make it prepare them in the section, the heel section, or the whole. In this case, since it does not step on with the shoes of the Goodyear welt type but the section is loaded with the shank, it is desirable to consider as the configuration which cannot prepare and step on a slot to a shank, but can send the moisture of the section or the heel section to a pedal. Furthermore, although this example explains the example applied to the shoes of the Goodyear welt type as illustrated, of course, it is also applicable to the shoes manufactured by other processes, for example, the shoes in a cement TEDDO type or a McKay style. However, in the shoes using the process which sews upper leather 2, inner SOL 3, and outsole 7 together from the inside like a McKay style, the water which advances from the seam of upper leather 2 and outsole 7 cannot be prevented only with the configuration of the above-mentioned example. So, in the case of McKay style shoes, it is good to load or to paste up the tape of non-water permeability only on (refer to drawing 4 ) and its suture section so that the whole in SOL inside which contains the suture section with the permeability insole 15 of non-water permeability separately may be covered on the top face of inner SOL 3.

[0013]

[Effect of the Invention] Since it is loaded according to the sole concerning this invention, without an object fixing between an inner SOL and the simple substance for film while having heights, since it is the magnitude in which the repeat of the pressurization and reduced pressure at the time of the touch-down at the time of a walk can promote the air migration in shoes, and the plane area of the inside object can cover all the through tubes of an inner SOL, even if the permeability film is damaged, water cannot permeate easily in shoes. Moreover, since the structure which also laminates the permeability film with textile fabrics with a coarse eye and textile fabrics with a fine eye is adopted, durability is higher than before.

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MEANS

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[Means for Solving the Problem] The outsole which has the through tube which penetrates this invention from an inside side to a ground-plane side in order to attain the above-mentioned purpose, The support for film by which a laminating is carried out to an outsole inside so that it may have the through tube penetrated from an inside side to a ground-plane side and this through tube may be open for free passage with the through tube of outsole, In the sole which comes to have the permeability film of non-water permeability of this support for film by which a laminating is carried out at least to the whole surface, and the inner SOL which has the through tube penetrated from an inside side to a ground-plane side While having the plane area which can cover all the through tubes of an inner SOL, it is characterized by arranging the object between the support for film, and an inner SOL, without fixing, while having two or more heights which project in a ground-plane side.

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EXAMPLE

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[Example]

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[0008] In this mid sole 5, the lamination sheet 9 has fixed so that all of that through tube 5a may be covered from both sides. This lamination sheet 9 has a three-tiered structure of textile-fabrics 9a with a coarse eye (for example, trade name made from Asahi Chemical APIKO "tricot"), permeability film 9b (for example, trade name by NITTO DENKO CORP. "micro tex") of non-water permeability and polyester textile-fabrics 9c with a fine eye, or a nonwoven fabric. The fixing approach sizes on the periphery section of textile-fabrics 9a with a coarse eye first, assigns it to the predetermined part of a mid sole 5, and piles up permeability film 9b there. Next, polyester textile-fabrics 9c sized on the periphery section is piled up. A paste permeates and fixes textile-fabrics 9a with a coarse eye, and permeability film 9b from the coarse eye of this textile-fabrics 9a. In addition, although the lamination sheet 9 is fixed to both sides of a mid sole 5, only one side is either here.

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[0012] In addition, in above-mentioned this example, although the improvement in permeability in shoes and the arrangement part of the through tube as a ventilating opening are used as the pedal, it is also possible to prepare all over the heel of shoes, the arch-of-foot section, and the heel section in consideration of the application and the operating environment assumed of shoes. Moreover, like the above-mentioned example, through tube 7a of outsole 7 considers only as a pedal, and does not step on the through tubes 3a and 5a of inner SOL 3 and a mid sole 5, but you may make it prepare them in the section, the heel section, or the whole. In this case, since it does not step on with the shoes of the Goodyear welt type but the section is loaded with the shank, it is desirable to consider as the configuration which cannot prepare and step on a slot to a shank, but can send the moisture of the section or the heel section to a pedal. Furthermore, although this example explains the example applied to the shoes of the Goodyear welt type as illustrated, of course, it is also applicable to the shoes manufactured by other processes, for example, the shoes in a cement TEDDO type or a McKay style. However, in the shoes using the process which sews upper leather 2, inner SOL 3, and outsole 7 together from the inside like a McKay style, the water which advances from the seam of upper leather 2 and outsole 7 cannot be prevented only with the configuration of the above-mentioned example. So, in the case of McKay style shoes, it is good to load or to paste up the tape of non-water permeability only on (refer to drawing 4 ) and its suture section so that the whole in SOL inside which contains the suture section with the permeability insole 15 of non-water permeability separately may be covered on the top face of inner SOL 3.

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CLAIMS

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[Claim(s)]

[Claim 1] The support for film by which a laminating is carried out to an outsole inside so that it may have the outsole which has the through tube penetrated from an inside side to a ground-plane side, and the through tube penetrated from an inside side to a ground-plane side and this through tube may be open for free passage with the through tube of outsole, In the sole which comes to have the permeability film of non-water permeability of this support for film by which a laminating is carried out at least to the whole surface, and the inner SOL which has the through tube penetrated from an inside side to a ground-plane side The sole characterized by arranging the object between the support for film, and an inner SOL, without fixing while having the plane area which can cover all the through tubes of an inner SOL and having two or more heights which project in a ground-plane side.

[Claim 2] the textile fabrics or the nonwoven fabric with a fine eye with which the laminating of said permeability film is carried out to the whole surface of the body of the permeability film, and this body of the permeability film, and the textile fabrics with a coarse eye by which are alike on the other hand and a laminating is carried out -- since -- the sole according to claim 1 which the textile-fabrics side with a coarse eye has pasted up on the support for film with adhesives.

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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] Drawing 1 is the exploded view of the sole concerning one example of this invention.

[Drawing 2] Drawing 2 is the sectional view of the sole concerning the above-mentioned example.

[Drawing 3] Drawing 3 is the expanded sectional view showing the lamination sheet adopted as the sole concerning the above-mentioned example, and an inside object.

[Drawing 4] Drawing 4 is the sectional view showing the example which adopted the sole of the above-mentioned example in the shoes of a McKay style process.

[Description of Notations]

1 Sole

2 Upper Leather

3 Inner SOL

5 Mid Sole

7 Outsole

8 Thin Leather

9 Lamination Sheet

11 Inside Object

13 Shank

15 Insole

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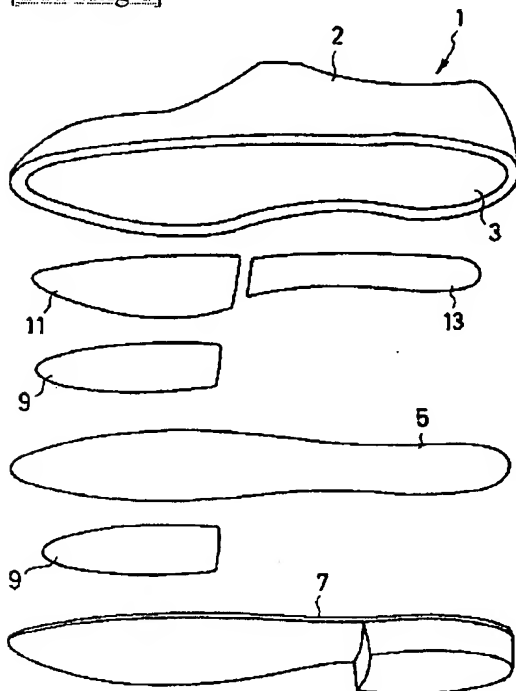
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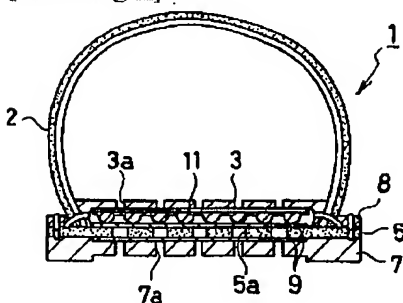
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## DRAWINGS

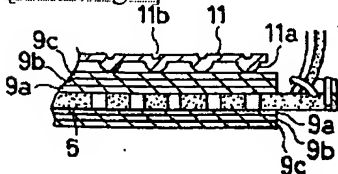
[Drawing 1]



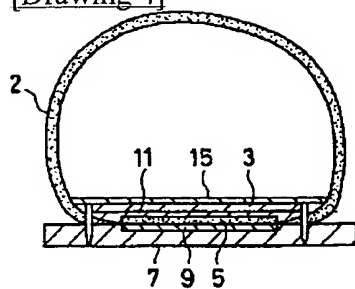
[Drawing 2]



[Drawing 3]



[Drawing 4]

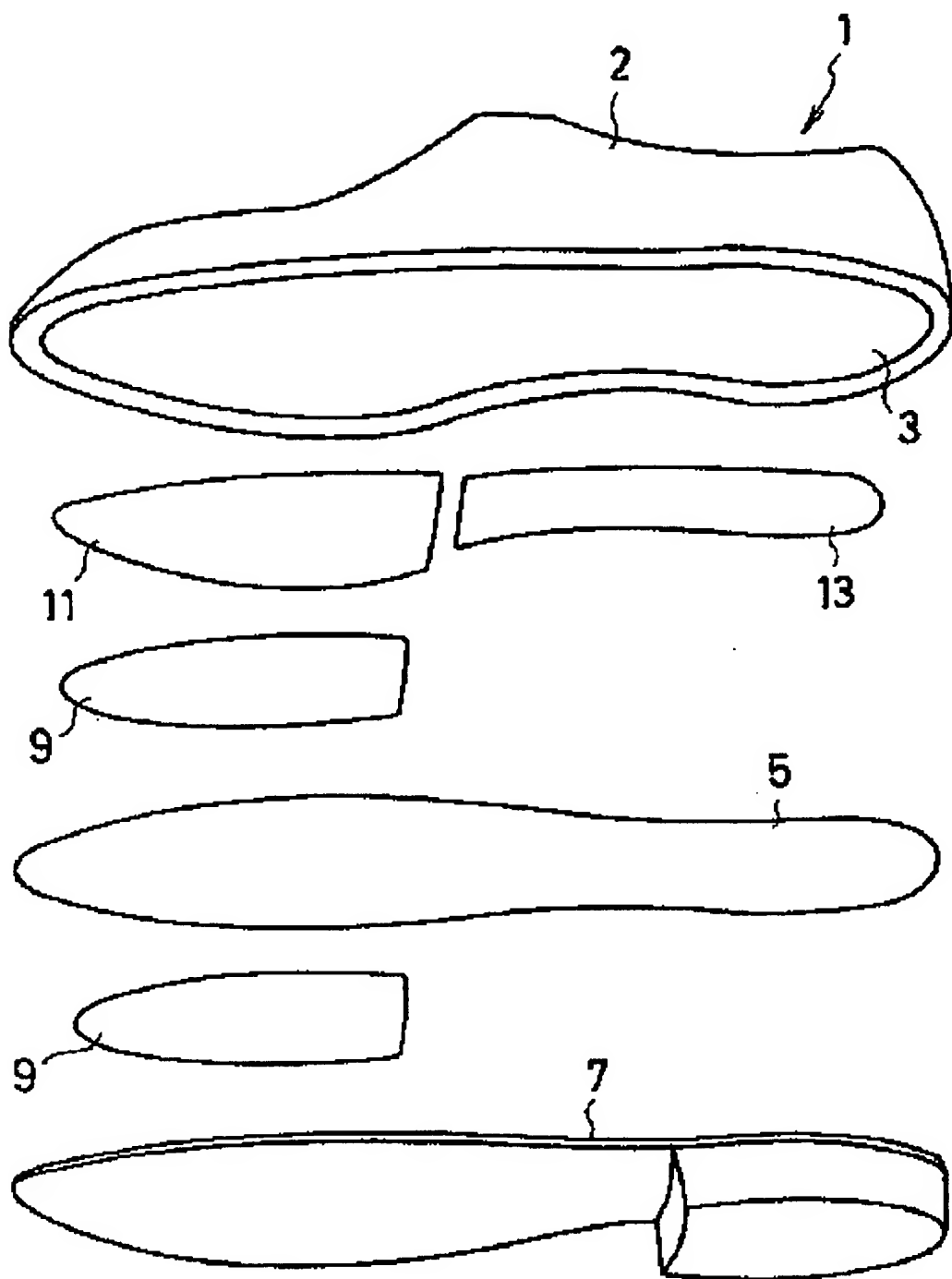


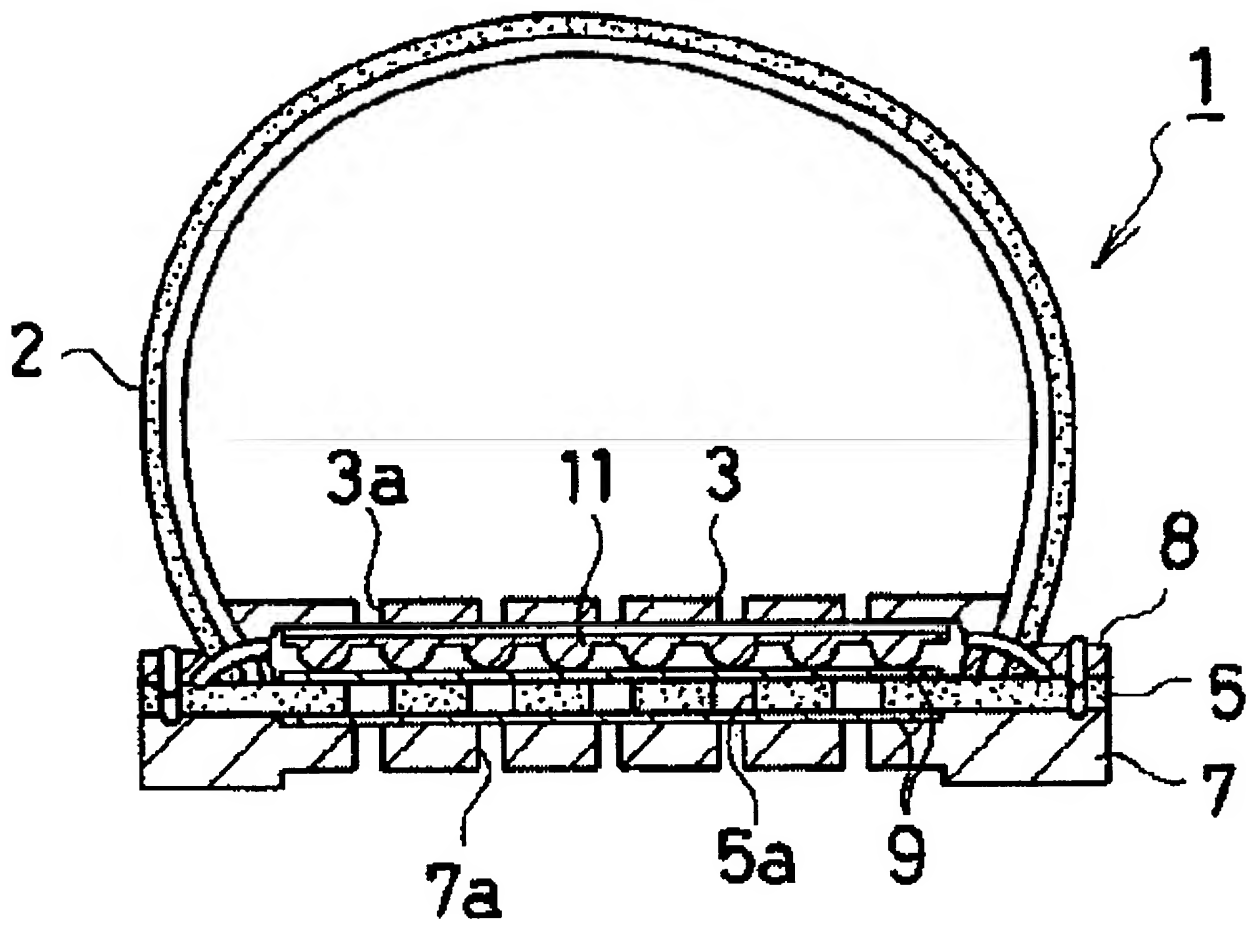
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